

BRASSICA BROCHURE

2008-2009

Premium quality cultivars
for optimum performance.



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BENEFITS OF BRASSICAS

WHY SOW BRASSICAS?

Brassica forage crops provide farmers with a large amount of high quality feed (high in energy and protein) for their stock and should be considered in any situation where pasture quantity or quality is limiting the potential of livestock.

WHEN TO USE BRASSICAS

- Periods of feed shortage through the summer, autumn and winter
- To supplement periods of low pasture quality
- To finish stock
- When a summer safe feed is required
- Prior to pasture renewal

WHY CHOOSE WRIGHTSON SEEDS BRASSICAS?

- New Zealand's market leading supplier of brassica forage crops
- Our joint forage brassica programme combines our expertise with Crop & Food Research
- The result is a range of class-leading brassicas

We are committed to providing brassica forage crops that not only produce high quantities of feed, but also lead to improved animal performance through feed quality, thereby providing positive benefits to the New Zealand farmer.

ANIMAL FRIENDLY™



Wrightson Seeds pioneered the technique of using animal productivity as the best measure of a forage's performance. Our ANIMAL FRIENDLY™ certification is applied to our cultivars with the following characteristics:

Forages with yield and persistence, that have produced improved animal performance in a scientific trial(s) and/or shown improved physical attribute(s) linked to animal performance.

FACT FILE

Brassicas provide a bulk amount of high quality feed to maximise growth rates and increase the number of stock finished or maintained per hectare.

A brassica crop provides a break from pasture, decreasing pest levels, eliminating weed problems and with fertiliser helps correct soil fertility problems, resulting in cleaner, higher producing pasture.

Using brassicas helps avoid parasites and pathogens that cause animal health problems such as facial eczema and ryegrass staggers.

Brassica crops can increase stock productivity and therefore increase farm profitability.

RESEARCH &
DEVELOPMENT



CULTIVAR
SELECTION



OPTIMUM
PERFORMANCE

PASTURE RENEWAL

WRIGHTSON SEEDS PROGRAMMED APPROACH™ TO PASTURE RENEWAL

The PROGRAMMED APPROACH™ is about implementing a plan that will maximise the potential of both a pasture and a forage crop. Done well, farmers will ensure they have a good supply of quality feed all year round.

IMPORTANT BENEFITS

- High quality feed when required
- Opportunity to break the perennial weed cycle using Glyphosate, leading to weed-free pastures
- Opportunity to break the clover pest cycle (e.g. Clover Root Weevil and Nematodes), leading to better clover establishment and production
- Opportunity to break the wild endophyte cycle to allow summer-safe grazing and successful introduction of novel endophytes
- No significant increase in labour requirements
- Encourages forward planning and the opportunity to address fertility and drainage issues earlier, which will ultimately result in more productive pastures and crops
- Increases the success of no-tillage cropping and pasture renewal systems

A PROGRAMME THAT SUITS YOUR SITUATION

The programme helps farmers by assisting them in identifying what species to grow and when to plant them for optimum production, therefore providing them with a better return from their investment in pasture renewal.

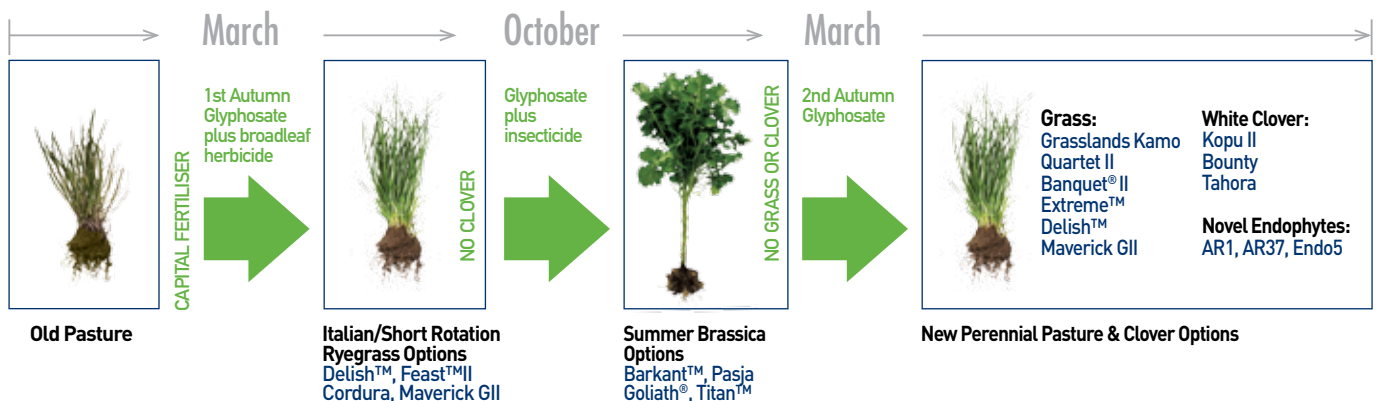
It has long been recognised that due to the diversity of New Zealand farming systems, there is unlikely to be one programme that is applicable to all farmers' needs. Two examples of the Wrightson Seeds PROGRAMMED APPROACH™ are detailed here.

BOTH PROGRAMMES USE

- Multiple sprays of Glyphosate to knock out weeds
- A short-term endophyte-free ryegrass like FEAST™ II or DELISH™ or Maverick GII to produce high quality winter feed
- A brassica crop to provide feed for key "pinch" periods (summer and winter)
- A new permanent pasture mix containing high performing ryegrass cultivars with novel endophytes like EXTREME™, BANQUET® II, Quartet II, DELISH™ and high performing clovers like Grasslands Kopu II or Bounty.

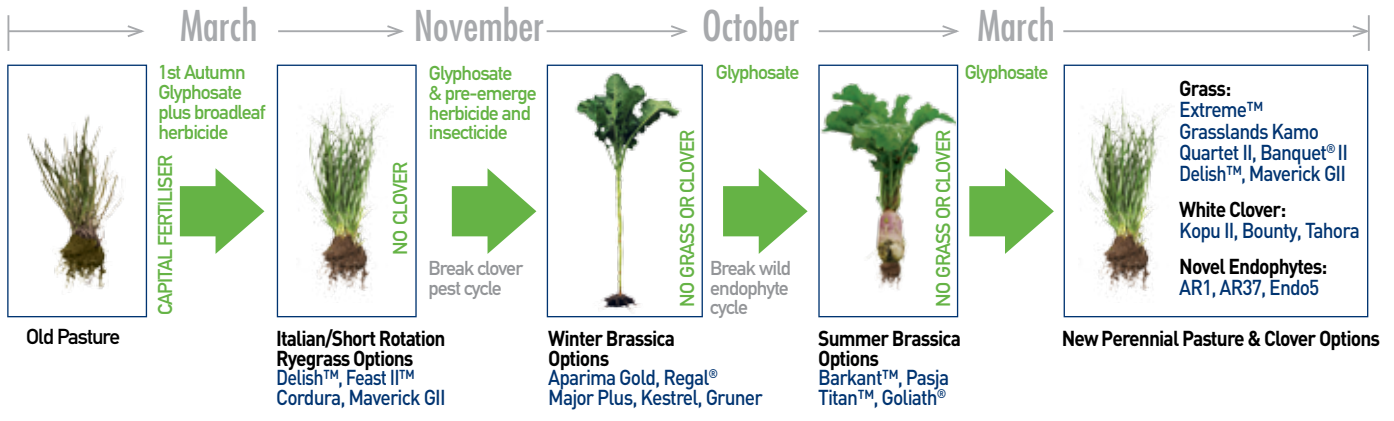
PROGRAMMED APPROACH™

EXAMPLE 1: SHORTER TERM SUMMER BRASSICA SYSTEM



PROGRAMMED APPROACH™

EXAMPLE 2: 24 MONTH PASTURE RENEWAL PLAN



SUMMARY

Regardless of what system you use, a key benefit of the Wrightson Seeds PROGRAMMED APPROACH™ is the opportunity to maximise the productivity of the farm, through maximising the amount of Dry Matter (DM) and Metabolisable Energy (ME) produced.

The Wrightson Seeds PROGRAMMED APPROACH™ to pasture renewal helps a farmer capture the full value of improved pasture genetics available in today's new grass and clover varieties.

For more information on how the Wrightson Seeds PROGRAMMED APPROACH™ could work for you, contact us on 0800 805 505.

HOW IS ME MEASURED?

To determine the ME of a feed, the total (gross) energy of the feed is measured in a laboratory. Any energy that is lost in the dung, urine or gas (methane) is also measured, and subtracted from total (gross) energy. What is left is metabolisable energy, or ME, available to the animal.

By reducing the amount of energy lost from the animal via dung, urine and gas, the ME of feed is improved. By improving the digestibility of a feed, or selecting feeds with high digestibility, the amount of energy lost via these waste products is reduced, and therefore ME increases.

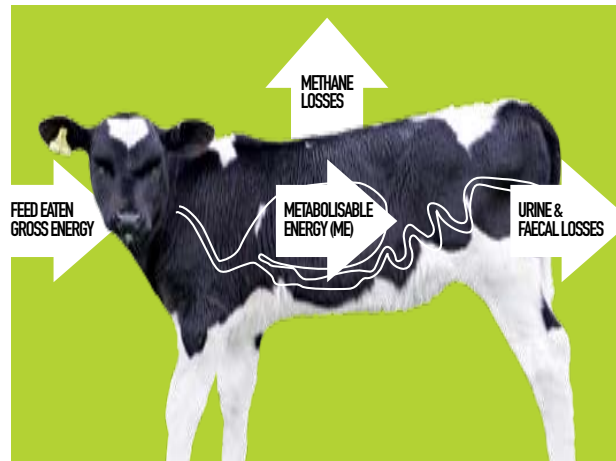
WHAT IS METABOLISABLE ENERGY (ME)?

Metabolisable Energy (ME) is the energy available to stock from a particular feed source, measured as megajoules of metabolisable energy per kilogram of dry matter (MJME/kg DM). For every kilogram of feed there is a given amount of energy available. A key driver of animal production (milk, meat or wool) is a pasture or crop that delivers both feed quantity (dry matter production) and quality (ME).

THE KEY TO HIGH ME PRODUCTION SYSTEMS

- Grazing management
- Use a range of cultivars that have different heading dates
- Use cultivars with reduced aftermath heading

THE ME EQUATION



Brassicas	ME	Grass/Clover Pasture	ME	Pasture Components	ME
Forage brassica	12.8-13.6	Spring – immature	12.0	Ryegrass – green leaf	12.0-13.0
Forage rape	12.8	Late spring – leafy	11.0	Ryegrass – green stem	11.0
Summer turnips	13.6	Summer – leafy	10.0	Ryegrass – mature stem	8.0
Winter turnips	12.8-13.6	Summer – dry & stalky	9.0	Ryegrass – mature leaf	7.0-8.0
Kale	12.8	Autumn	11.8	White clover	12.0
Swedes	13.9	Winter	11.0	Chicory - leafy	11.7

GROSS ENERGY (FEED EATEN)



ENERGY LOST AS DUNG, URINE OR GAS



METABOLISABLE ENERGY (ME)

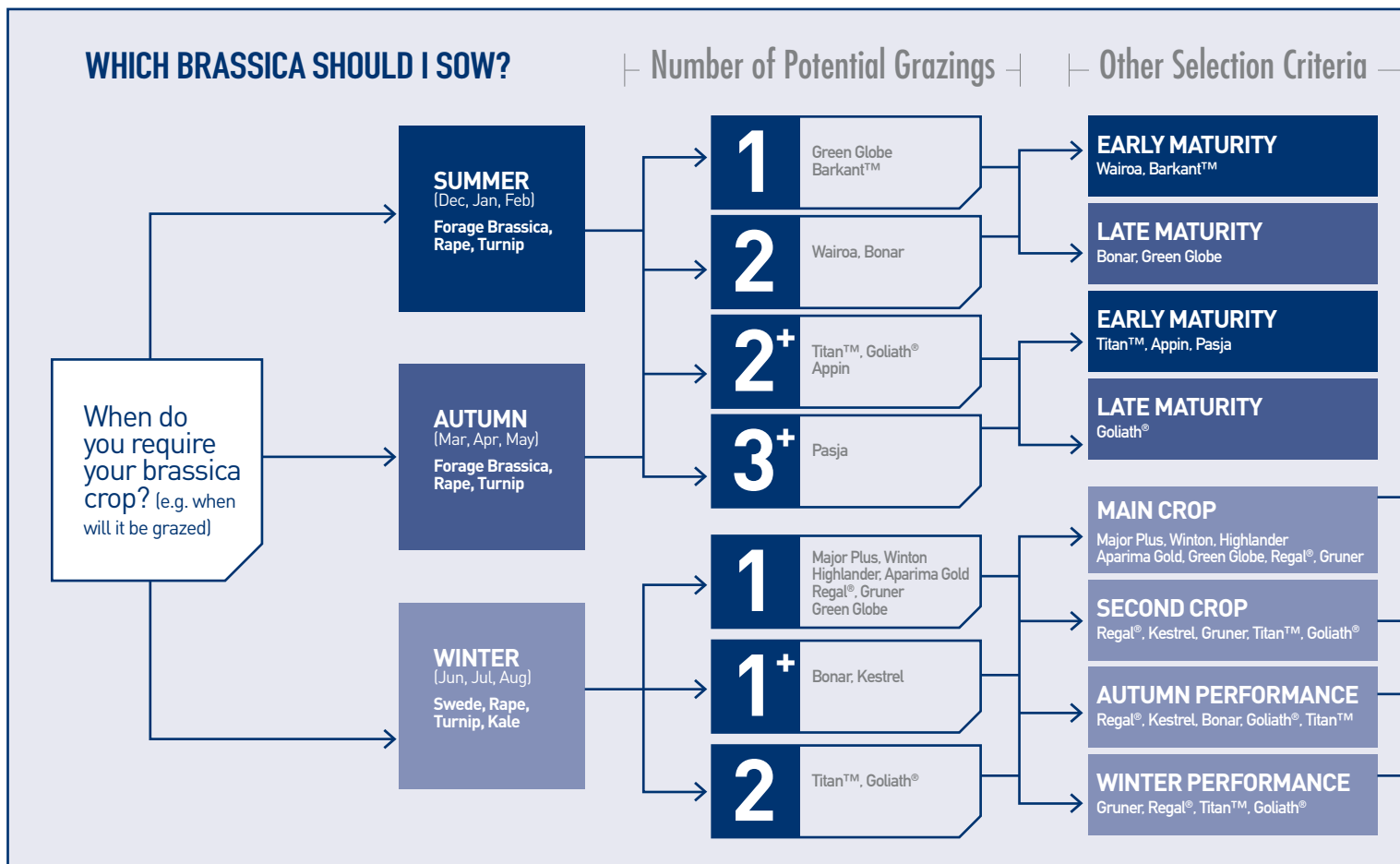
BRASSICA PLANNING

1. Soil test poor producing paddocks 6-8 weeks prior to sowing
2. Apply fertiliser and lime as per specific soil test recommendations
3. Aim to control all weeds prior to sowing
4. Sow the most suitable brassica crop for your needs at approx 1cm deep with a soil temperature of around 10°C and rising
5. Use ULTRA STRIKE®/SUPER STRIKE® treated brassica seed. This is recommended in both cultivated and direct drilling situations to enhance crop establishment and performance.

FACT FILE: CROP HUSBANDRY

If brassicas are sown following a crop, consideration should be given to the previous crop's herbicides when making the brassica selection.

Ideally brassicas should not be planted more than once in a five-year rotation where clubroot or dry rot is a problem, even when using clubroot or dry rot tolerant varieties.



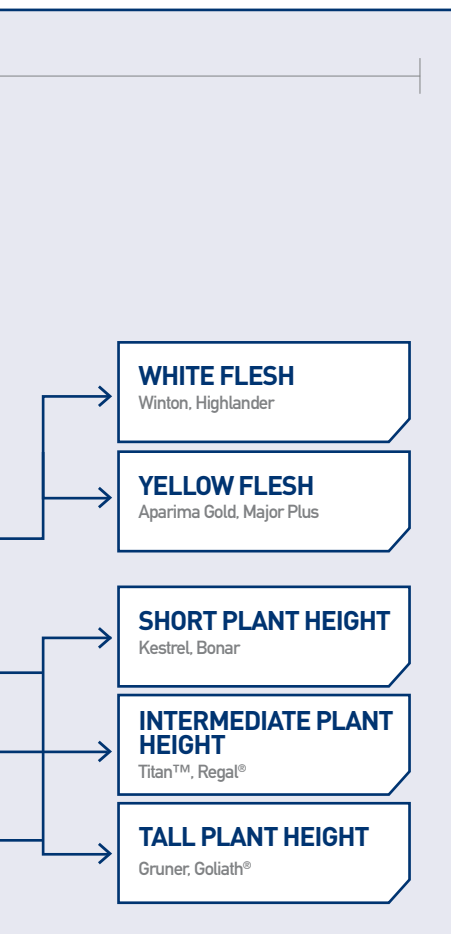
BRASSICA SOWING

1. Allow the paddock to get a pasture or weed cover of 2000kg DM/ha
2. Spray out with Glyphosate at the correct label rate
3. Three days later, hard graze to remove vegetation prior to cultivation or drilling
4. If cultivating, use conventional farm practises that result in a fine, firm, residual free seedbed
5. In cultivated situations, seed can be broadcast, then harrowed and rolled
6. If direct drilling or drilling into cultivated soil, seed should be sown at approximately 1cm and then rolled
7. Once the crop is sown, it is important to monitor the crop and apply the appropriate herbicides and insecticides to remove any weed or insect problems

FACT FILE: FERTILISERS

The soil pH level should be at least 5.6 and ideally between 5.8 and 6.2 for most brassicas. Crops should have at least 40-60kg phosphate/ha available at sowing.

Paddocks should have low soil sulphate levels. After grazing, a light application of nitrogen will greatly increase yields of subsequent growth. Avoid high nitrate levels in the crop.



BRASSICA RANGE

SWEDES



KALE



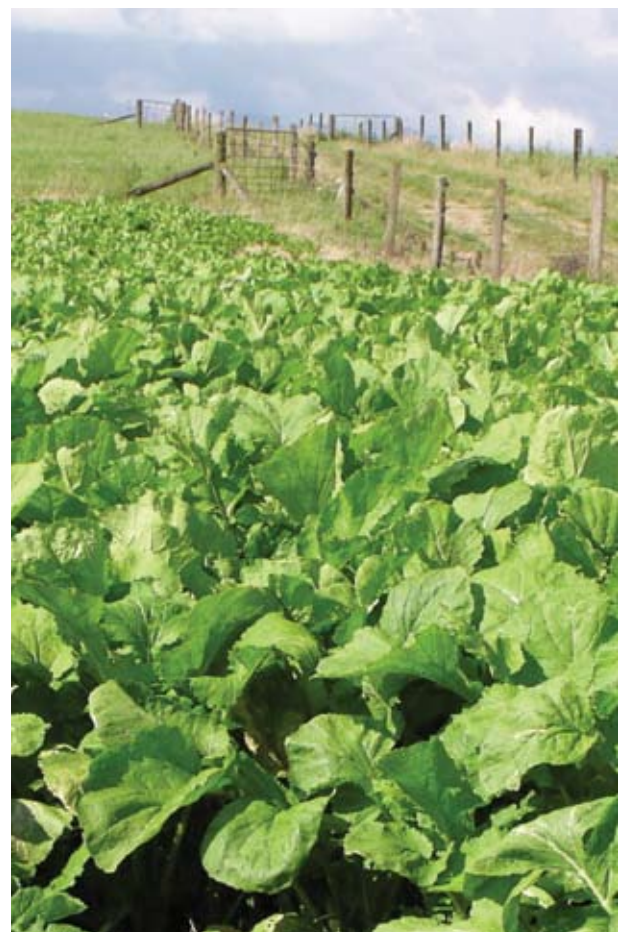
FORAGE RAPE



TURNIPS



FORAGE BRASSICA





Jim Ferris - Manager Motu Station, Puketitiri, Western Southland

"On our farm in the Lillburn Valley we winter 750 dairy cows and 450 rising one year old steers and 200 carry over cattle on 100 hectares of Aparima Gold swedes.

Last year we sowed a similar amount and wintered 10,000 hoggets solely on Aparima Gold. Our stock find it palatable and it is reliable and yields well in our stony environment. To date our average yield has been 17 tonnes per hectare.

We are able to feed the crop right through to October as Aparima Gold goes to seed later, holding its quality right through the winter months. We feed the swede crop in conjunction with baleage and straw and the steers make good weight gains.

We attribute this to the palatability and good tops of Aparima Gold, which ensures there is no need for further regrazing as we traditionally are required to do with other swede crops.

Aparima Gold swedes are an integral part of our farming system. We rely on these to get through our 120 day winter, providing a 110 day feed supply. Going by their past performance – I would recommend them to anyone."

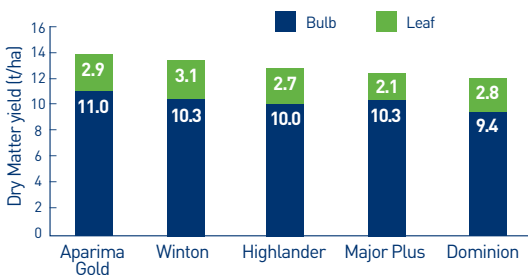


YELLOW-FLESHED SWEDES

- Highest yielding main crop swede, potential yield 18,000kg DM/ha
- Bred and trialed by Crop and Food Research for New Zealand grazing systems
- Yellow-fleshed bulb with medium maturity
- Clubroot and dry rot tolerant
- Excellent keeping qualities with high leaf percentage

- A main crop, early maturing, soft bulbed swede
- Bred and trialed by Crop and Food Research for New Zealand grazing systems
- Good yielding swede with a potential of 16,000kg DM/ha
- Yellow-fleshed, light purple skinned bulb

DRY MATTER PRODUCTION (T/HA) OF SWEDE CULTIVARS



Combined results from five trial sites 2005/06 in Gore, Otago, Tinwald, Lake Coleridge and Waiouru.

SWEDE SOWING RECOMMENDATIONS

In environments where brassica crops can be exposed to very cold conditions post sowing followed by increasing temperatures (Southland/Otago), swedes should be sown no earlier than the 20th of November. Earlier sowing combined with weather conditions as outlined above can cause 'vernalisation' which means the plant believes it has been through winter and subsequently produces a seed head.



WHITE-FLESHED SWEDES

- Main crop swede
- White-fleshed bulb
- Medium maturity
- Disease resistance of Tina but yield potential of Highlander
- Good proportion of leaf
- Clubroot and dry rot tolerant

- Main crop swede
- White-fleshed bulb
- Later maturing



William Low - Borst Holding Ltd, North Otago

"We run a large dairy unit that consists of five farms and we milk over 2000 cows. Normally we put in about 100 hectares of winter feed for our dry cows.

Last year we sowed Regal kale for the first time and were most impressed with it. We took yields of 18 tonnes/ha, and although it didn't grow as tall as the Gruner kale did, due to the extra leaf area of Regal kale, we found that it still yielded the same.

This extra leaf also meant that the utilisation of the crop was excellent. Perhaps the biggest recommendation for Regal we can offer is that based on its performance last year, we have put in 20 hectares of Regal kale this season, and it is already looking fantastic."



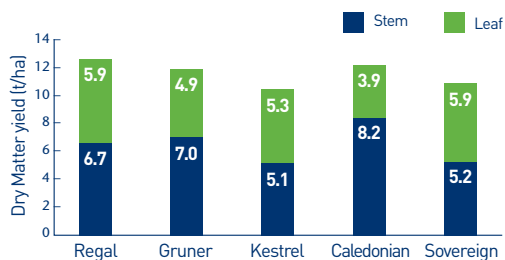
NEW!



- Highest yielding intermediate height kale with a potential yield of 18,000kg DM/ha
- Bred and trialed by Crop and Food Research for New Zealand grazing systems
- High leaf to stem ratio (greater than 45% leaf)
- Excellent crop utilisation due to selection for low stem fibre
- Very good winter hardiness and excellent pest and disease tolerance
- First and second crop option

REGAL[®] is an intermediate height kale which has been bred for a high leaf percentage (>45% leaf) for better utilisation, in conjunction with a high total yield in order to maximise stock productivity. Extensively trialed prior to commercial release, REGAL[®] has been proven to perform well against other kales in the market. In addition to this, field trials have shown REGAL[®] to be a very winter hardy kale with proven yield potential and feed value.

DRY MATTER PRODUCTION (T/HA) OF KALE CULTIVARS



Combined average results from four trial sites 2005/06 in Southland, Otago, Canterbury and the Manawatu.



For further trial results refer to pages 10, 11.



Campbell Sanders - Sheep and Beef Farmer, Maruia Valley, West Coast

"I tried Gruner kale for the first time as a second crop option following swedes. My aim was to produce a large bulk of feed for carrying some older beef cows over winter.

The Gruner kale has exceeded my expectations and I have been very impressed with its excellent growth during what has been a difficult season. I certainly intend planting another crop of Gruner next year."

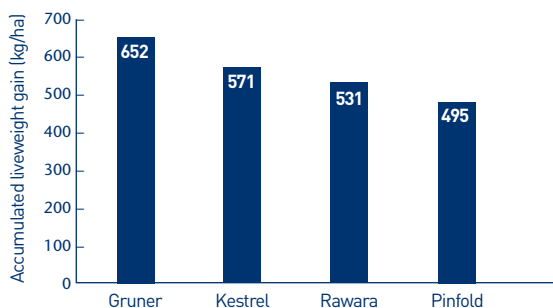


- Very high yielding giant type kale with potential yield of 17,000kg DM/ha
- Highest leaf percentage of all giant kales available
- Excellent tolerance to frost and good leaf holding capability
- Good aphid tolerance
- A proven and reliable kale for NZ grazing systems
- First and second crop option



- Medium height kale with excellent leaf to stem ratio (greater than 50% leaf)
- Excellent crop utilisation due to highly digestible stem
- Superior animal production due to enhanced forage quality
- Bred for low levels of SMCO (S-methyl cysteine sulphoxide)
- Good regrowth if lightly grazed during late summer
- Second crop option

LIVEWEIGHT GAIN TRIAL (KG/HA) OF 1YR FRIESIAN BULLS GRAZING KALE

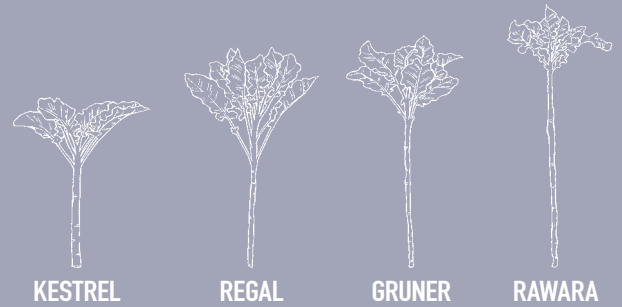


Adapted from Garrett, B.C.; Westwood, C.T.; Nichol, W.W. Nutritive value of optimising animal production from forage brassicas. Proceedings of the New Zealand Institute of Primary Industry Management 2000: 61-73.



For further kale trial results refer to pages 9 and 11.

KALE OPTIONS



FEED VALUE OF KALE

In deciding which kale cultivar to use in a particular situation farmers should consider dry matter yield potential and differences between cultivars in nutritional value if the aim is to maximise animal performance and productivity.

DRY MATTER PRODUCTION

To drive productivity, the focus should be on maximising dry matter intake of individual animals (and the quality of that dry matter) and also on stocking rate. Therefore, as Figure 2 shows, cultivars such as Gruner and the newly released REGAL® offer key benefits, being high yielding whilst maintaining a high proportion of the dry matter as leaf relative to stem, the implications of which are outlined below.

NUTRITIVE VALUE

When feeding a kale crop there is always going to be a compromise between high animal performance and crop utilisation. To achieve both, a key focus in the development of cultivars such as REGAL®, Gruner and Kestrel has been maintaining a high leaf to stem ratio. As shown in Figure 1, leaf dry matter has a much higher nutritive value than stem material due to higher crude protein and soluble carbohydrate concentrations and lower fibre concentrations. Furthermore, because leaf is easier to harvest than stem material, dry matter intake will be higher on cultivars with high leaf to stem ratios and this should also lead to improved crop utilisation.

WHICH CULTIVARS DO I CHOOSE?

For sheep, young cattle and weaner deer the obvious choices are Kestrel and REGAL®. As the class of livestock gets bigger REGAL® and Gruner will be more suitable options.

FIGURE 1: KALE CULTIVAR FEED QUALITY INFORMATION

	REGAL	GRUNER	KESTREL	RAWARA	
LEAF	Leaflet				
	ME (MJ/kg DM)	13.7	13.8	13.7	13.7
	CP %	21	22	21	25
	NDF %	13	13	15	12
	Petiole				
	ME (MJ/kg DM)	13.6	13.7	13.7	13.5
CP %	8	9	8	11	
NDF %	20	19	20	20	
STEM	Upper stem				
	ME (MJ/kg DM)	13.7	13.7	13.9	13.3
	CP %	10	12	12	10
	NDF %	20	19	17	23
	Mid stem				
	ME (MJ/kg DM)	12.5	12.3	13.6	11.9
	CP %	6	6	10	5
	NDF %	32	33	23	37
	Lower stem				
ME (MJ/kg DM)	11.1	10.3	12.7	9.6	
CP %	3	4	6	2	
NDF %	45	48	30	53	

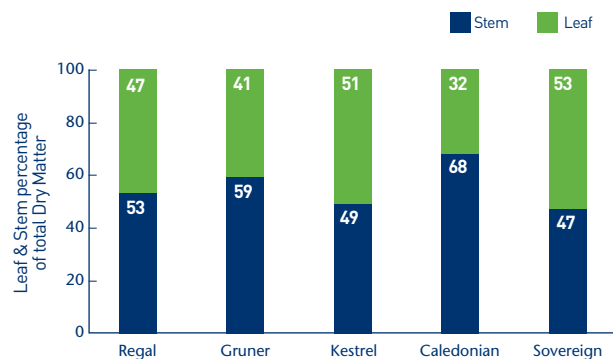
ME – Metabolisable energy (MJ/kg DM)

CP% – Crude protein as % of dry matter

NDF% – Neutral detergent fibre as % of dry matter

Data collected from Crop and Food Research Trial, Gore.

FIGURE 2: LEAF AND STEM PERCENTAGE OF TOTAL DRY MATTER



Combined average results from four trial sites 2005/06 in Southland, Otago, Canterbury and the Manawatu.



Paul Weeks - South Wairarapa

Paul Weeks farms a 1100 hectare property in South Wairarapa. "The arable areas on the farm are cropped and regressed on a seven year rotation. Summer crops have always been an important component of the rotation and this year (2007), Titan rape was included for the first time alongside the traditional Pasja crop, for which we selected the heavier paddocks.

A difficult spring meant our sowing date was delayed until early November and the ongoing summer drought meant we had to graze the Titan well before the recommended maturity date. We had all our lambs on crop by the middle of January. Summer rain was virtually non-existent, however the performance of Titan was just outstanding. We managed three very valuable grazings over the summer, finishing a high proportion of lambs at high stocking rates, at times at up to 100 to the hectare and even when we thought the crop must be done and dusted we achieved another graze with our ewe hoggets.

We certainly plan to use Titan rape again next season. If it turns out to be anything like a "normal" year, we expect to be able to finish many more lambs and perhaps grow it on as a winter crop for the ewe hoggets."



NEW!

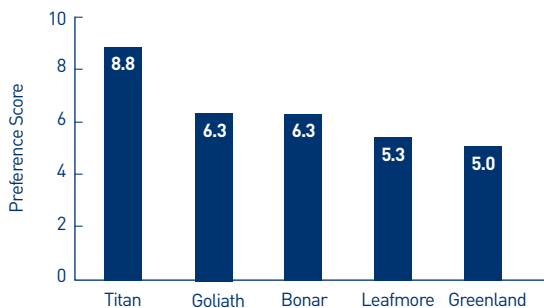


- A new generation rape x kale interspecies cross
- Bred and trialed by Crop and Food Research for New Zealand grazing systems
- Highest yielding multi-graze, intermediate height rape available with a potential yield of 10,000kg DM/ha
- Highest animal preference cultivar available (see below)
- Excellent regrowth potential
- Early maturing (70-90 days) similar to Rangi rape
- Suitable for summer, autumn and winter feed
- Excellent aphid and virus tolerance

TITAN™ forage rape is a high yielding, intermediate height rape which has been bred to replace Maxima Plus. TITAN™ has high aphid and virus tolerance and has shown excellent palatability against other commercially available rapes.

TITAN™ is an early maturing forage rape and can be used for summer, autumn and early winter feed. Suitable for all stock classes.

STOCK GRAZING PREFERENCE OF DIFFERENT FORAGE RAPES (The higher the score the better)



Preference: 1 = Crop untouched
9 = Crop completely eaten

Trial was conducted at the Kimihia Research Centre, Canterbury in spring 06 and summer 07. Visual preference score was done 30 January 2007.
Trial sown on 1 November 2006.

For Dry Matter Production Results for TITAN™ forage rape, refer to page 13.





Mike King - Lonestar Farms, Mt Albert Station, Lake Wanaka

"Traditionally we have had problems finishing our lambs as we found ryegrass pasture was just not enough. The feeding of Goliath rape in conjunction with the traditional runoff pasture and hay supplement, has seen an incredible change.

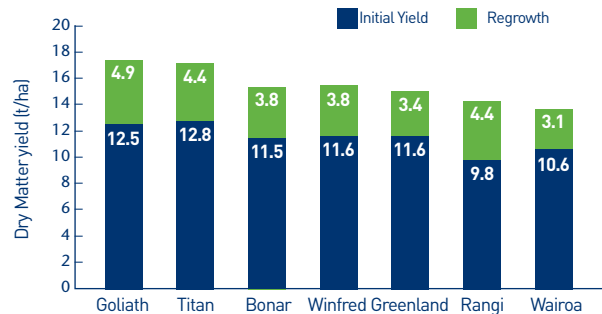
Our lambs were putting on 250-300 grams a day this season on the crop and the numbers we were able to get away and the prices they were fetching, also reflected this increase.

We found that Goliath has fared a lot better than our other brassica crops, especially with its growth rates, which is a real added bonus. The regrowth of this crop is phenomenal. This will be used to winter yearling steers which are normally on-sold."



- A new generation rape x kale interspecies cross
- Bred and trialed by Crop and Food Research for New Zealand grazing systems
- Highest yielding multi-graze giant rape available, a potential yield of 10,500kg DM/ha
- Multi-purpose forage rape with excellent summer/autumn/early winter feed
- Superior regrowth potential with excellent winter keeping properties
- Maturity of 90-110 days
- Good aphid tolerance

DRY MATTER PRODUCTION (T/HA) OF FORAGE RAPE



Trial was conducted at Kimihia Research Centre, Canterbury in spring 2005.



- High forage yield and quality
- Excellent autumn/early winter feed option
- Later maturing, good regrowth potential
- Can be sown in spring and autumn

For trial results for Bonar forage rape, refer to GOLIATH® forage rape above.





John and Sue Presow - Eketahuna

John and Sue milk 450 jersey cows at Eketahuna. Even though Eketahuna is considered to be "summer safe", turnips are a vital component in keeping their milk volumes up over the summer, especially this year, when they experienced a real decrease out of their pastures.

"Our policy is to have 8-10% of the farm in turnips as a quality summer feed and as part of an ongoing pasture renovation programme. The majority of the area is sown in Barkant turnips with part of the later paddocks in Green Globe turnips.

Barkant turnips constitute about 25% of the cow's daily diet. The balance is in pasture, on occasions other protein supplements such as PKE have been included in small amounts, this has depended on need, price and availability.

We always value our Barkant crops, but this year in a drought we just couldn't have managed without them."

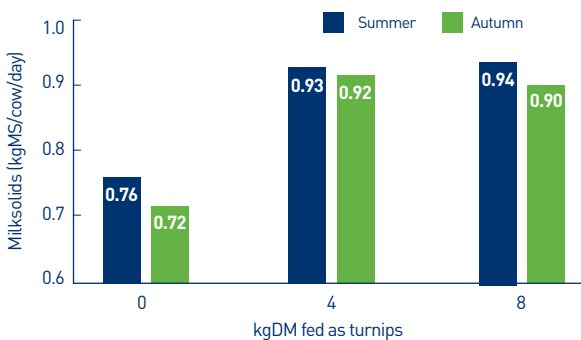


SUMMER TURNIPS

- Highest yielding summer bulb turnip available, a potential yield 15,000kg DM/ha
- High leaf to bulb ratio resulting in high levels of protein
- Shown in an independent animal trial to increase summer/autumn milksolids production by 25%
- Tankard bulb shape to enhance utilisation and reduce risk of choke associated with round bulbs
- Early maturing (60-90 days) for excellent summer feed

Barkant™ turnips produce high quality feed with a high metabolisable energy (ME) value, meaning greater animal performance can be achieved. It is a high performance feed for lactating dairy cows supplying the energy required to boost milk production.

EFFECT OF INCREASING ALLOWANCE OF TURNIPS ON MILKSOLIDS YIELD



(All cows given supplementary pasture at 25kgDM/cow/day)
 Harris, S.L., Clark, D.A. Waugh, C.D., Copeman, P.J.A. and Napper, A.R. 1998.
 Use of Barkant turnips and Superchow sorghum to increase summer-autumn milk production.
 Proceedings of the New Zealand Society of Animal Production 58: 121-124.

HOW PROFITABLE ARE TURNIPS IN A DAIRY SYSTEM?

Profitability of turnips in a dairy system depends on:

- Value of milksolids
- Milksolid response
- Level of pasture substitution

COSTS & RETURNS (\$ PER HA) OF ESTABLISHING A CULTIVATED BARKANT TURNIP CROP FOR DAIRY GRAZING

COSTS		YOUR WORKING
Average Establishment Costs	\$1399	
RETURNS		
Average yield (kg DM/ha)	13,000	
80% Utilised yield (kg DM/ha) (assuming 20% wastage) (13,000 x 80%)	10,400	
Milksolids/ha response (80g MS/kg turnip fed) (10,400kg DM/ha x 0.08)	832 kg MS	
Gross returns (@ \$7/kg/MS) (832 x 7)	\$5824	
NET RETURN		
\$7.00 kg/MS and 80g MS/kg DM (\$5824 - 1399 = \$4425)	\$4425	

Developed from the Forage Brassica Development Group, "Best Management Practices for Forage Brassica, May 2008 Workshop Handout".
 For more information please see www.wrightsonseeds.co.nz.



Paul Mitchell - Halfway Bay Station, Queenstown

"We first tried Green Globe turnips at Halfway Bay Station after a recommendation from our rep and seeing how well it performed on neighbouring farms. Now 3 seasons later we are continuing to use Green Globe. We've increased the area we sow, and we are consistently achieving 9-10 tonnes DM/ha.

Green Globes work well for us as they are suited to our soil type plus the later sowing date compared with swedes means the paddock is out of grass for less time. We are really impressed with the Green Globe, because with its high quality once the hoggets have adapted to it, there is no holding them back and they thrive on it! We certainly intend to use Green Globe in the future."

TURNIPS

Green Globe TURNIP

SUMMER/WINTER TURNIPS

- Multi-purpose product can be sown for grazing in summer, autumn and winter
- Most winter hardy bulb turnip available
- Good yield potential (10,000kg DM/ha)
- Late maturing (90 – 120 days)

SUGGESTED CROP

This crop can be used as a summer dairy option. Given the different maturity dates of summer turnips the following practice may help in maximising summer milk production. Planting 2/3 of the crop area in BARKANT™ and 1/3 in Green Globe turnips at the same time, **in different paddocks**, provides farmers with a summer feed that can be grazed from 60–120 days. This is because the early maturing BARKANT™ can be grazed from 60–90 days and the later maturing Green Globe grazed from 90–120 days after planting. Using this system, farmers don't have to worry about the quality of their turnip crop declining because they are trying to maintain an early maturing cultivar for too long, and they don't need to worry about reduced yields by having to graze a later maturing crop too early.

Green Globe and BARKANT™ complement each other very well and provide a better option than planting turnips with a medium maturity date, as they don't get the benefits of early or late feed quality and quantity.

TIME OF FEEDING	
BARKANT™	Early – mid summer
Green Globe	Late summer/autumn



WINTER TURNIPS

- High leaf yields from multi-crowned bulbs
- Excellent regrowth potential
- Firmly anchored for minimum wastage
- Particularly useful for late sowing
- Clubroot tolerant



Rodney Finnie - Mid Canterbury

"We sowed 30 hectares of Pasja for the first time last year, and have been very impressed by this hardy forage brassica.

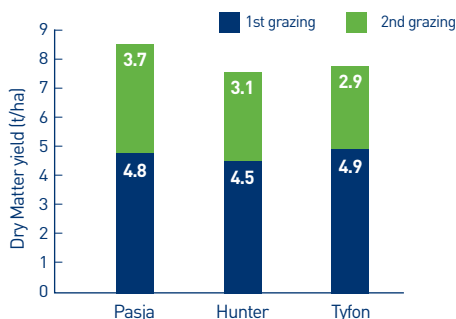
We ran 1700 Corriedale lambs after the first draft solely on this crop and found that our lamb finishing for the works reduced from a four week to a two week turnover and our lambs were consistently fetching over \$50 a head.

The regrowth of this crop was incredible. We achieved five grazings and found that even in the dry Canterbury conditions, this crop would just keep growing. We are sowing 30 hectares again with the plan to increase the lamb count to 2000. With Pasja we feel we're onto a winner."



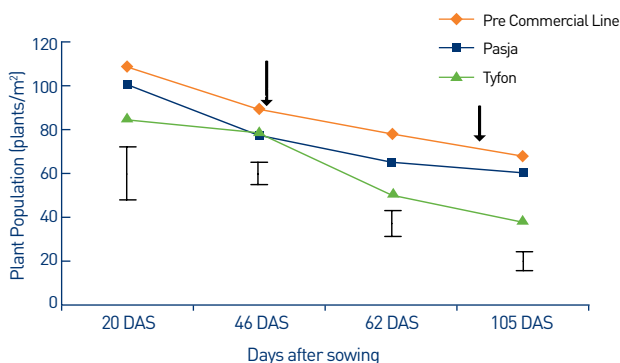
- High yields from successive grazings (potential yield of 12,000kg DM/ha over multiple grazings)
- Fast establishing, high quality feed ready for grazing within 42-70 days of sowing
- Excellent plant persistence after multiple grazings
- Provides a flexible grazing option for all stock classes over summer and autumn
- Minimal ripening requirement

DRY MATTER PRODUCTION (T/HA) OF MULTI-GRAZE LEAFY TURNIPS



Trial conducted at Kimihia Research Centre, Canterbury. Trial was sown on 14 October 2004 and harvested on 15 December 2004 (63 days after sowing), and then was allowed to regrow and was harvested again on 24 January 2005 (50 days regrowth). Pasja was found to have significantly ($p < 0.05$) more regrowth yield than Tyfon.

PLANT PERSISTENCE OF MULTI-GRAZE LEAFY TURNIPS



Trial conducted at Kimihia Research Centre, Canterbury. Plant number reductions over two regrowth periods over the summer, trial was sown 2 November 2006. Arrows indicate the time of grazing (47 DAS) and (99 DAS). Bar=LSD 5%.



Pasja (foreground) and Tyfon (background) on 1 February 2007 (105 DAS) on the second regrowth period. Photo shows the improved persistence of Pasja related to Tyfon.



- High forage yields
- Highly palatable
- Rapid maturing
- Provides a flexible grazing option

PESTS & DISEASES

PEST		PREVENTION/CONTROL
Aphids		<ul style="list-style-type: none"> ULTRASTRIKE® seed treatment Aphid tolerant varieties Contact insecticide Recognise flight periods and control infestations early
Grass Grub		<ul style="list-style-type: none"> Heavy grazing (March-June) to reduce Grass Grubs' feed supply Thorough cultivation in spring Granular insecticide
Leaf Miner		<ul style="list-style-type: none"> Removal of alternative hosts (e.g. Fathen, Sowthistle etc.) to prevent build-up of numbers
Diamondback Moth		<ul style="list-style-type: none"> Removal of old brassica plants which may act as carry over hosts Application of contact insecticide
White Butterfly		<ul style="list-style-type: none"> Natural predators (e.g. hoverfly, harvestman and parasitic wasps) Removal of old brassica crop, debris and weeds to prevent overwintering and localised build-up Contact insecticide
Wheat Bug (Nysius)		<ul style="list-style-type: none"> ULTRASTRIKE® seed treatment Control of weeds around crop borders will help reduce localised numbers Contact insecticide
Springtail		<ul style="list-style-type: none"> ULTRASTRIKE® or SUPERSTRIKE® seed treatment Contact insecticide
White Fringed Weevil		<ul style="list-style-type: none"> Thorough cultivation should be carried out through late spring and summer prior to sowing in infested areas, clean fallow reduces numbers Granular insecticide sown with seed
Greasy Cutworm		<ul style="list-style-type: none"> Good seed bed cultivation and compaction Granular insecticide sown with seed or worked into the top 15cm of soil
Slugs		<ul style="list-style-type: none"> Slug bait should be applied when extreme slug numbers are present or in direct drilling situations slug bait should be applied in two half applications
Argentine Stem Weevil		<ul style="list-style-type: none"> ULTRASTRIKE® seed treatment Removal of host ryegrass plants Recognise flight periods and control infestations early Contact insecticide
DISEASE		PREVENTION/CONTROL
Dry Rot		<ul style="list-style-type: none"> Use rape or kale Crop rotation and minimise crop residual in second year crops
Black Rot		<ul style="list-style-type: none"> Bury previous crop debris Crop rotation
Leaf Spot		<ul style="list-style-type: none"> Insecticide
Ring Spot		<ul style="list-style-type: none"> Crop rotation
Clubroot		<ul style="list-style-type: none"> Crop rotation Use kale
Wirestem/Damping Off seedling diseases		<ul style="list-style-type: none"> ULTRASTRIKE®/SUPERSTRIKE® seed treatment

SEED TREATMENT ULTRASTRIKE®

ULTRASTRIKE®

BRASSICA SEED TREATMENT

ULTRASTRIKE® Brassica is a broad-spectrum seed treatment that combines highly advanced protective additives which have been specifically formulated to enhance the establishment and performance of brassica crops. ULTRASTRIKE® with its additional insect protection, in conjunction with fungicide protection, provides the most comprehensive level of pest protection in the brassica seed treatment market.

ULTRASTRIKE® BRASSICA SEED TREATMENT INCLUDES:

1. A systemic insecticide to control Springtail, Aphids, *Nysius* (Wheat Bug) and Argentine Stem Weevil during plant establishment. Springtail and Aphids are the pests most frequently responsible for brassica crop failures during establishment. Under good growing conditions ULTRASTRIKE® will provide 10 weeks protection against Aphids.
2. Two contact fungicides effective against the 'Damping Off' diseases *Pythium*, *Fusarium* and *Rhizoctonia solani* (Wirestem).
3. Molybdenum, an essential trace element for general brassica growth and to reduce the risk of 'Whiptail', which causes a reduction in leaf size and irregularities in leaf formation.
4. Bird repellent, important for broadcast sowing.

RECOMMENDED USE

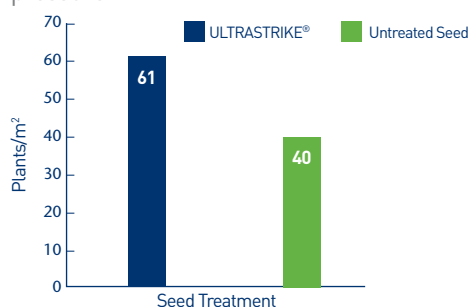
ULTRASTRIKE® Brassica seed treatment is recommended for all winter brassica crops such as kale and swedes. These crops require protection over an extended period from pests such as Aphids. Autumn sown crops and no-tillage sowings should also be protected with ULTRASTRIKE® because of the increased threat of insect pressure.

TRIAL RESULTS

The results of trials demonstrate that in comparison to untreated seed, ULTRASTRIKE® provides improved plant establishment and protection against insects in establishing brassica crops.

PLANT ESTABLISHMENT

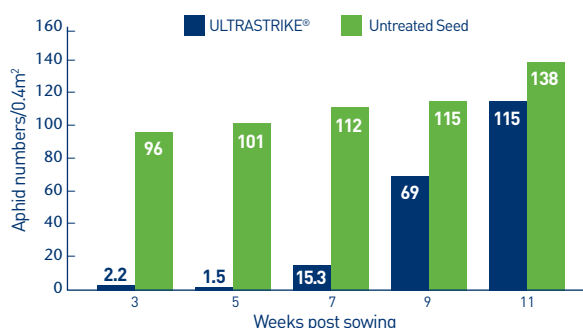
Number of Bonar rape plants/m², three weeks after sowing (Amberley, North Canterbury), under Springtail pressure.



APHID PROTECTION

A field trial was conducted to assess the effectiveness of ULTRASTRIKE® against Aphid attack. Field cages (0.4m²) were infested with 56 adult Aphids on a 2 weekly basis, with the Aphids populating the cages for 7 days, with Aphid survival assessed at 3, 5, 7, 9 and 11 weeks after sowing.

ULTRASTRIKE® VERSUS UNTREATED SEED UNDER APHID PRESSURE



ULTRASTRIKE® treated seed provided significantly improved protection against adult Aphids in comparison to untreated seed at 3, 5, 7 and 9 weeks after sowing, with no statistical difference in Aphid survival at 11 weeks.

SEED TREATMENT SUPERSTRIKE®

SUPERSTRIKE®

BRASSICA SEED TREATMENT

SUPERSTRIKE® Brassica is a unique broad-spectrum seed treatment which combines highly advanced protective additives which have been specifically formulated to enhance the establishment and performance of your brassica crop.

SUPERSTRIKE® BRASSICA SEED TREATMENT INCLUDES:

1. A systemic insecticide to control Springtail during plant establishment. Springtail is the pest most frequently responsible for brassica crop failures, destroying unprotected seedlings at emergence.
2. Two contact fungicides effective against the 'Damping Off' diseases *Pythium*, *Fusarium* and *Rhizoctonia solani* (Wirestem).
3. Molybdenum, an essential trace element for general brassica growth and to reduce the risk of 'Whiptail', which causes a reduction in leaf size and irregularities in leaf formation.
4. Bird repellent, important for broadcast sowing.

RECOMMENDED USE

SUPERSTRIKE® Brassica seed treatment is recommended for spring-sown summer brassica crops such as rape or turnips where Springtail is generally the major insect pest that affects plant establishment. In regions where Aphids, Argentine Stem Weevil and *Nysius* (Wheat Bug) pressure is likely to be low during the establishment period, SUPERSTRIKE® will provide very cost effective protection for winter crops such as kale and swedes.

BRASSICA ESTABLISHMENT UNDER SPRINGTAIL PRESSURE

UNTREATED BRASSICA

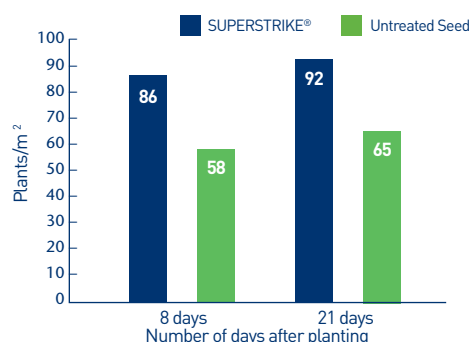
SUPERSTRIKE® TREATED BRASSICA



TRIAL RESULTS

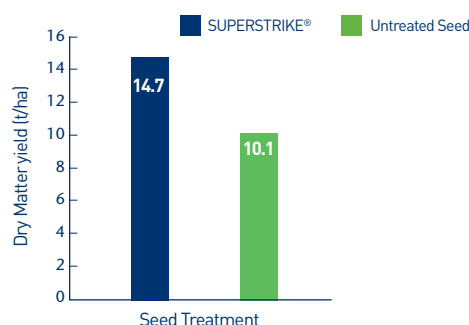
The results of trials demonstrate that in comparison to untreated seed, SUPERSTRIKE® provides improved plant establishment and protection against insects in establishing brassica crops.

COMPARISON OF PLANT ESTABLISHMENT SUPERSTRIKE® VERSUS UNTREATED SEED



Gruener kale plants per metre square 8 and 21 days after sowing at Gore, Southland, treated with SUPERSTRIKE® versus untreated seed (Dec 1998).

COMPARISON OF DRY MATTER PRODUCTION SUPERSTRIKE® VERSUS UNTREATED SEED



Dry matter production (t/ha) 207 days after sowing at Gore, Southland from Gruener kale treated with SUPERSTRIKE® versus untreated seed (June 1999).

BRASSICA CROPS

FEEDING RECOMMENDATIONS FOR BRASSICA CROPS

The following basic feeding guidelines have been developed from many years of trialling and monitoring brassica crops, and are designed to help maximise the animal production from brassicas.

1. DON'T ALLOW STOCK SUDDEN UNRESTRICTED ACCESS TO A BRASSICA CROP.

Sudden access can upset the balance of rumen microbes, resulting in poor animal performance scouring and acidosis. Start by grazing the crop for no more than 1-2 hours per day, building up to a maximum allowance over at least 7-10 days. Allow rumen microbes time to adjust to the high quality forage.

2. FEED EXTRA FIBRE PRIOR TO AND WHILE GRAZING BRASSICA CROPS.

Forage crops are highly digestible, and don't contain much 'effective fibre', the sort of fibre that makes animals chew.

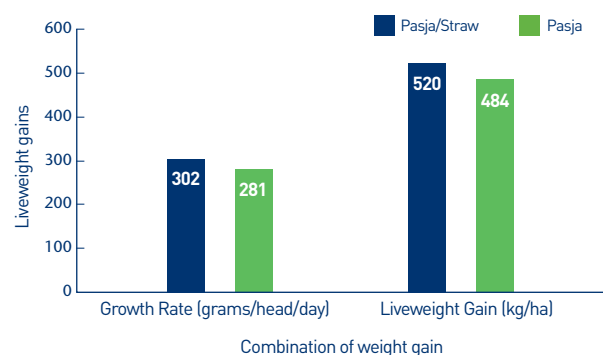
Feeding extra effective fibre means:

- More chewing and increased salivation, which helps maintain rumen pH and as a result there will be fewer digestive upsets.
 - Slower flow of feed through the rumen and gut, with a more effective rumen fermentation.
 - Increased cud chewing and more effective digestion.
- Extra fibre should be given prior to and throughout the brassica feeding period, through access to pasture, hay or straw. This will help to prevent gorging, help rumen microbes adjust to the feed and help to maintain normal rumen function. It is suggested that 20-30% of the diet is fed as hay, straw, or runoff pasture.



FEEDING A SOURCE OF FIBRE WITH PASJA

LAMB GROWTH RATES AND PER HECTARE PRODUCTION RESULTS



Lambs supplemented with ryegrass straw grew at faster rates than lambs fed no fibre.

3. FEED BRASSICAS AS PART OF A BALANCED DIET.

Animal performance on brassicas is best when crops are fed strategically as part of a balanced diet. For example, the high protein and energy of brassicas complements stalky summer ryegrasses which can be deficient in energy and protein, or whole-crop cereal and maize silages which are low in protein. Feed dry stock no more than 70-80% of the diet as brassica, and feed dairy cows no more than 33% of their diet as brassicas if milk is being sent to the factory.

4. AT ALL TIMES GIVE ANIMALS ACCESS TO WATER WHEN GRAZING A BRASSICA CROP.

Although the water content of brassicas is high, it is recommended that animals have access to fresh water at all times as a limited water intake will cause an animal's dry matter intake to decline.

5. RECOGNISE POTENTIAL FOR STOCK HEALTH PROBLEMS.

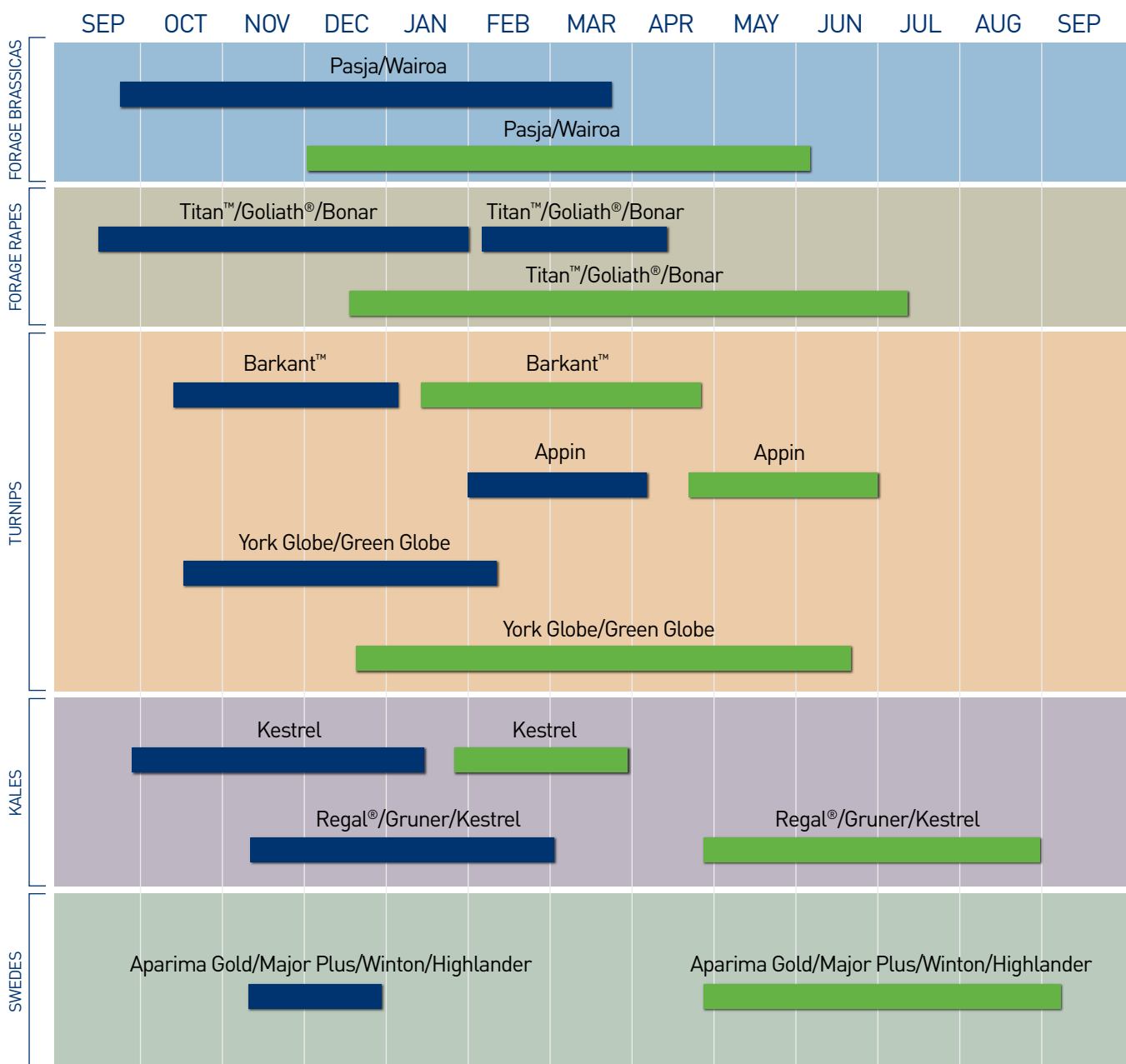
Feeding brassicas can sometimes be associated with animal health problems. Risk can often be avoided by good agronomic and grazing management.

For more information call 0800 805 505.

GROWING & GRAZING

GROWING AND GRAZING GUIDE

■ Sow* ■ Graze



CHECK WITH YOUR SEED RETAILER FOR THE BEST TIME TO SOW AND GRAZE CROPS IN YOUR AREA.

* Make sure soil temperatures are around 10°C and rising before sowing.

BRASSICA FORAGE SELECTION AND PRODUCTION GUIDE

YIELD/PRODUCTION (BASED ON AVERAGE YIELD)

SUMMER/AUTUMN FEED		Forage Brassica		Rape			Turnips
		PASJA **	WAIROA	TITANT™	BONAR	GOLIATH®	BARKANT™
Sowing Rate (kg/ha)		3-4	3-4	3-4	3-4	3-4	1-3
Days to Grazing		42-70	70-85	70-90	90-110	90-110	60-90
Regrowth Ability	Regrowth	V. High	Mod	High	Mod	Mod-High	Nil
	No. of grazings	3+	2	2	2	2	1
Crude Protein%*	Stem/Bulb	-	10-14	10-14	10-14	10-14	10-16
	Tops	13-22	15-24	15-24	15-24	15-24	12-22
Potential Yield (kgDM/ha)		12,000	10,000	10,000	10,000	10,500	15,000
Metabolisable Energy (MJ/kgDM)		13.6	12.8	12.8	12.8	12.8	13.6
Average Yield (kgDM/ha)		9,000	7,000	9,000	9,000	9,500	10,000
Digestibility		85	80	80	80	80	85
% Utilisation		75	75	90	80	80	90
Average Feed Available (kgDM/ha)		6,750	5,250	8,100	7,200	7,600	9,000
COWS - Number of cows (450kg) in mid lactation fed at 1/3 daily ration on brassica per hectare for 30 days		45	35	54	48	51	60
SHEEP - Number of lambs (28kg LW, growing at 200g/day) able to be fed on one hectare for 30 days		150	117	180	160	169	n/r

Assumptions: Cows intake 16kg DM/hd/day = 5kg DM/hd/day as brassica Lambs intake = 1.5kg DM/hd/day as brassica

BRASSICA FORAGE SELECTION AND PRODUCTION GUIDE

YIELD/PRODUCTION (BASED ON AVERAGE YIELD)

WINTER FEED		Winter Feed Turnip			Kale			Swedes			
		YORK	APPIN	GREEN GLOBE	REGAL®	KESTREL	GRUNER	MAJOR PLUS	WINTON	HIGHLANDER	APARIMA GOLD
Sowing Rate (kg/ha)		0.8-1.5	1-3	0.8-2.0	3-4	3-4	3-4	0.8-1.5	0.8-1.5	0.8-1.5	0.8-1.5
Days to Grazing		60-80	60-100	90-120	150-220	150-220	150-220	150-230	160-240	170-250	170-250
Regrowth Ability	Regrowth	Nil	High	Nil	Low	Low	Low	Nil	Nil	Nil	Nil
	No. of grazings	1	2+	1	1	1	1	1	1	1	1
Crude Protein%*	Stem/Bulb	10-16	-	10-16	8-12	8-12	8-12	8-12	8-12	8-12	8-12
	Tops	13-22	13-22	13-22	15-20	15-20	15-20	15-24	15-24	15-24	15-24
Potential Yield (kgDM/ha)		8,000	8,500	10,000	18,000	12,000	17,000	16,000	18,000	18,000	18,000
Metabolisable Energy (MJ/kgDM)		13.6	12.8	13.6	12.8	12.8	12.8	13.9	13.9	13.9	13.9
Average Yield (kgDM/ha)		6,000	7,500	8,000	12,000	9,500	13,000	13,000	14,000	14,000	14,000
Digestibility		85	80	85	80	80	80	87	87	87	87
% Utilisation		80	80	80	70	70	70	80	80	80	80
Average Feed Available (kgDM/ha)		4,800	6,000	6,400	8,400	6,650	9,100	10,400	11,200	11,200	11,200
COWS - Number of cows (450kg) able to be fed at maintenance on one hectare for 30 days		20	25	27	35	28	38	43	47	47	47
SHEEP - Number of ewes (55kg) able to be fed at maintenance on one hectare for 30 days		160	200	213	280	222	303	347	373	373	373

Assumptions: Cows intake 10kg DM/hd/day for maintenance = 8kg DM/hd/day as brassica
Ewes intake 1.25kg DM/hd/day for maintenance = 1kg DM/hd/day as brassica

NB: For optimum productivity, stock wintered on brassicas should be offered a proportion of their daily intake as hay or straw in addition to brassica.

Key: * = Protein range sourced from several trials over several years, ** = Average yield of Pasja based on 3+ grazings, n/r = not recommended
These figures are indications which allow you to compare animal production achievable on the various brassica options. Remember, many factors other than yield should be considered when choosing your brassica option.

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“Brassicas fit into most farming systems offering a timely feed option along with an excellent quality feed. To gain the best results from your brassica crops it is important that planning is the first step to success. Our experienced field team are located throughout New Zealand to ensure that when you are making these important decisions their skills and knowledge are available to support your local seed reseller. We hope that our market proven cultivars and this 2008-09 Brassica Brochure will help you make the right choices to achieve your targeted farming goals.”

PAUL KENNY

New Zealand Sales and Marketing Manager
027 380 6668

CONTACT DETAILS

For more information on brassica forage seeds or the information contained within this brochure, contact your local seed retailer, talk to one of our representatives above or phone 0800 805 505.

www.wrightsonseeds.co.nz

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NOTES:

RECOMMENDATION ORDER FORM: TO BE COMPLETED IN CONSULTATION WITH YOUR LOCAL SEED RETAILER

Paddock ID	Ha	Variety	Sowing Rate	Agronomic Recommendation prior to sowing
TOTAL				

Name: _____

Address: _____

Contact Phone No: _____

Fax No: _____

E-mail: _____